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Results-Based Forest and Range Practices Regime for British Columbia
Discussion Paper for Public Review and Comment

A BRIEFING IN THE PUBLIC INTEREST

Submitted through Ralph Archibald
Director, Forest Practices Branch, Ministry of Forests, to
Professor George Hoberg, Director of the Consultation Process.

Written by

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On the state of the environment:

Seen in the light of "the reality-grounded opinion of the overwhelming majority of statured scientists who study the environment ... the environment is much less a controversial subject than suggested by routine coverage in the media." [1]

On risk:

"In ecology, as in medicine, a false positive diagnosis is an inconvenience, but a false negative diagnosis can be catastrophic. That is why ecologists and doctors don't like to gamble at all, and if they must, it is always on the side of caution. It is a mistake to dismiss a worried ecologist or a worried doctor as an alarmist." [2]

Edward O. Wilson

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[1] Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf, pages 280 to 281.
[2] *Ibid.*, page 298.

EXECUTIVE SUMMARY

One of the chief weaknesses of the discussion paper is that it does not place the need for a results-based code in the context of forest history, of land-use planning for sustainability, and of the larger legal regime. One of the key assumptions of the results-based code is that clearly defined land-use objectives or interim proxies will be available for all areas of the province. These objectives or proxies are not in place, which renders invalid the claim that the code is results-based from the perspective of the principle of sustainability

Secondly, and perhaps the most significant oversight, the authors omit a precise statement of purpose with respect to the resources at risk because of forest and range practices. We are told that licensees will manage risk. But precisely what resources are at risk and from what practices? And what level of risk is acceptable for each resource?

Thirdly, the authors of the discussion paper do not define and differentiate between the terms: practice, value, and principle, which may indicate unclear and disorganised conceptual thinking. Lack of clarity can be expected to lead to misunderstanding of the central purpose of the legislation, to obscure intent in the regulations, and, ultimately, to unenforceable laws.

In the discussion, a conceptual framework is proposed with brief descriptions of some main elements: context, resources, practices, purpose, values, principles, and new era commitments. Emphasis is placed on clear definition of these terms.

As the premier acknowledges, British Columbians have strong environmental concerns to be respected.[3] However, the discussion paper raises some simple questions about those concerns that citizens might reasonably ask:

1. Will the results-based code:
    - Articulate accurately the economic, environmental and ethical values held by British Columbians and differentiate clearly between them?
    - Set out the principles by which forests and grasslands are to be managed? Will it explain what sustainability and sustainable use mean?
    - Specify clearly that biodiversity, water and soil are the chief resources we need to protect, conserve, and sustainably develop? Will the timber resource be accurately represented as a part of a larger biodiversity resource?
    - List and explain the main forest and range practices?
    - Explain what biodiversity, water, and soil mean and why it is important to strike a balance between their conservation and development? Will it help to indicate what that balance might be and to define it?
    - Clearly spell out the relationship between each forest and range practice and its corresponding potential negative impact on biodiversity, water, and soil? Will it stipulate an acceptable level of risk of damage to biodiversity, water, and soil for each forest and range practice?

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[3] Premier of British Columbia. Letters to the Honourable Michael de Jong and to the Honourable Stan Hagan both dated June 25th, 2001.

Executive Summary continued

2. Will the results-based code explain that we cannot use the resources of biodiversity, water, and soil without some risk to their integrity and conservation? Will it explain how a results-based code will limit our risks and to what levels? Indeed, what are acceptable and prudent levels of risk?
3. Will forest and range practices on public lands in British Columbia result in:
   - Damage to, and fragmentation of, habitat being limited within acceptable levels of risk to biodiversity;
   - Control of invasive plants within acceptable limits;
   - Minimised damage to riparian systems and maintenance of the quantity and quality of fresh water to acceptable standards;
   - Minimised degradation and erosion of the soil within acceptable standards; and,
   - Sustainable economic development of the timber and fodder resources while maintaining high environmental standards?
4. Given the new era commitments[4], is it possible to strike the right balance between development and conservation, between what is destroyed and what is preserved, and between what is developed for humankind and what is left for non-human life? Will the code be an effective legal instrument to help ensure balance is achieved? And how will a results-based code premised on the principles of protection and conservation, sustainability and science-based decision-making conflict with some of those commitments?
5. Will the proposed results-based code be enforceable? What legal advice does government have that indicates the code will be enforceable?

This writer cautions that some key elements of an enforceable results-based code appear not to be in place – particularly a balanced conceptual framework, key indicators, and clear land-use objectives based on the principle of sustainability. If so, their omission might make it difficult to hold licensees accountable or to apply the promised tough penalties for non-compliance with the code, which, in short, is the government's stated intent.

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[4] Gordon Campbell and the BC Liberals. 2001. *A New Era for British Columbia: A Vision for Hope & Prosperity for the Next Decade and Beyond.* www.bcliberals.com See also page 11 of this document.

INTRODUCTION

What does a reasonable citizen of British Columbia expect from legislation governing forest and range practices? By answering this question in lay terms, we can explore the elements of a conceptual framework, and develop some simple questions that a concerned citizen might reasonably ask. And having obtained informed answers to those questions, we will be in a position to assess whether or not the proposed results-based code will satisfy public expectations.

CRITIQUE

A reasonable citizen expects a conceptual framework within which she would have some confidence that the regulations and results of forest and range practices at different spatial and temporal scales would strike the right balance between development and conservation, between what is destroyed and what is preserved, and between what is developed for humankind and what is left for non-human life. Only then, can he meaningfully expect the code and its regulations to be enforced with tough penalties for non-compliance.

One of the chief weaknesses of the discussion paper is that it does not place the need for a results-based code in the context of forest history, of land-use planning for sustainability, and of the larger legal regime. One of the key assumptions of the results-based code is that clearly defined land-use objectives or interim proxies will be available for all areas of the province. These objectives or proxies are not in place, which renders invalid the claim that the code is results-based from the perspective of the principle of sustainability.

Secondly, and perhaps the most significant oversight, the authors omit a precise statement of purpose with respect to the resources at risk as a result of forest and range practices. We are told that licensees will manage risk. But precisely what resources are at risk and from what practices?

Thirdly, the authors of the discussion paper do not define and differentiate between the terms: practice, value, and principle. In the absence of a precise statement of purpose related to the resources to be protected and conserved, the reader is asked to believe that the intent is to protect and conserve an alphabet-soup of "forest and range values" among which are included everything from best management practices (wildlife trees) to ethics (soil conservation), from actual resources (genes) to forest practices (silviculture), and from true values (cultural heritage) to statements of management principle (enhancement of productive capacity) – even 'R' for roads is included. If we are not clear as to what resources are at risk and why, and what levels of damage are acceptable, then how can we set science-based standards and relevant results for licensees to achieve?

Consequently, material of a framework (context, resources, practices, purpose, values, and principles) that belongs in the statute is mixed up in the discussion paper with material that either belongs in regulations (acceptable levels of risk, technical standards,

and results expected) or in guidelines (specific techniques to achieve results within acceptable levels of risk and to specified standards). This may indicate unclear and disorganised conceptual thinking or it may simply reflect a lack of time to refine the document. In either case, lack of clarity on these aspects of the proposed regulatory regime can be expected to lead to misunderstanding of the central purpose of the legislation, to obscure intent in the regulations, and, ultimately, to unenforceable laws.

Therefore, our discussion will emphasise clear definition of terms with a view to interrelating the previously mentioned confusion of parts into a well-organised, coherent and systemic whole by which the discussion paper can be assessed for integrity as a conceptual framework within which meaningful regulations and guidelines can be developed.

DISCUSSION

The envisaged conceptual framework comprises these parts: context, resources, practices, purpose, values, principles, and new era commitments. The parts described are partial. This discussion does not deal with risk management, land- and resource-use assumptions, key indicators for monitoring and evaluation, and the availability of scientific information on best practices.

Context

The essential contextual elements are the historical perspective, the larger legal regime, and the role of land-use planning in achieving sustainability.

By way of background, the government created two new ministries mostly from the old ministry of environment, lands and parks and partly from the ministry of forests. These new ministries are water, land and air protection (WLAP) and sustainable resource management (MSRM).

The mandate of WLAP is to:

- Protect human health and safety by ensuring clean and safe water, land and air,
- Maintain and restore the natural diversity of ecosystems, fish and wildlife and their habitat, and,
- Provide park and wildlife recreation services and opportunities to British Columbians and visitors.

The mission of MSRM is to provide provincial leadership for sustainable economic development of the province's land, water and resources.

The mission of the ministry of forests (MOF) is to protect and manage our public forests for the sustained benefit of all British Columbians. Also, MOF is responsible for determining the rate of timber harvesting.

Resources

The resources that these three ministries (WLAP, MSRM, and MOF) protect, develop or manage in common are:

1. Biodiversity,
2. Water, and,
3. Soil.

Biodiversity.[5] Trees and grasses are implicitly part of a larger biodiversity resource. Biodiversity is everywhere organised into three levels:

1. Ecosystems,
2. Species, and,
3. Variety of genes.

British Columbia is Canada's most ecologically diverse province. Ecosystems are not just economically valued for the timber and fodder they produce. Additionally, they perform valuable services that have economic benefits.[6] The principle of sustainability is economically important not only in its application to timber supply but also to ecosystem services.[7] Therefore, the notion of ecosystem stability is also important to human life.[8]

The forces that negatively affect species ranked by order of importance are[9]:

- Habitat destruction (by logging, fragmentation, urbanisation, and agricultural settlement of the forested ecosystem)[10],
- Invasive species (especially on grasslands),
- Pollution[11],

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[5] One definition is: "The variety of organisms considered at all levels, from genetic variants belonging to the same species through arrays of species to arrays of genera, families, and still higher taxonomic levels; includes the variety of ecosystems, which comprise both the communities of organisms within particular habitats and the physical conditions under which they live." [Wilson, Edward O. 1992. *The Diversity of Life*. Cambridge, Mass.: Belknap Press of Harvard University Press].

[6] Ecosystem services include: regulation of the atmosphere and climate; the purification and retention of freshwater; the formation and enrichment of the soil; nutrient cycling; the detoxification and recirculation of wastes; the pollination of crops; and the production of lumber, fodder, and biomass fuel." [Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, page 106].

[7] "The marginal value, defined as the rate of change in the value of ecosystems services relative to the rate of fall in the availability of these services, rises sharply with every increment in the fall. If taken too far, the rise will outpace human capacity to sustain the needed services by combined natural and artificial means." [Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, page 106].

[8] "By 'stability', they mean one or other or both of two things: first, how narrowly the summed abundances of all species vary through time; and, second, how quickly the ecosystem recovers from fire, drought, and other stresses that perturb it." [Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, page 108].

[9] Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, page 50.

[10] The area-species principle says that "As the area shrinks, the sustainable number of species falls by the sixth to third root of the area. At the fourth root, the reduction of the habitat to one-tenth its original area eventually causes the fauna and flora to decline by about one-half...While removal of 90 percent of the habitat area allows half of the species to hang on, removal of the final 10 percent can wipe out the remaining half in one stroke." [Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, pages 58 to 59].

- Population[12] (increased and uncontrolled human access), and,
- Overharvesting (i.e., rates of harvesting and areas harvested resulting in unsustainable pressure on biodiversity, soil, and water).

Or use the acronym HIPPO for short.

Genetic diversity is essential to the health and evolution of species. Public ownership of genetic material (i.e., genetic diversity) has enormous potential economic benefits for citizens. For example, only a minute fraction of biodiversity has been used in medicine in spite of its obvious potential for new drugs.[13]

The chief concerns related to forest and range practices are increased and uncontrolled human access, habitat destruction, invasive species, and overharvesting.

Water.[14] Water is essential to all land-based life and to freshwater aquatic life. Its quality and quantity as safe drinking water is of unquestioned value to most citizens. Water also sustains the salmon fishery and agriculture. Perhaps its greatest economic benefit to most citizens is in the form of hydroelectric power. Water is an integral part of all land-based ecosystems. "Forested watersheds capture rainwater and purify it before returning it by gradual runoffs to the lakes and sea, all for free".[15]

The chief concerns relating to forest and range practices are that riparian systems are not disturbed, spawning habitat is not destroyed, and that the turbidity, retention, temperature, purification, rate of flow and amount of water are not adversely affected.

Soil.[16] Soil takes thousands of years to form depth sufficient to sustain productive growth. It is directly or indirectly the substrate of all land-based life.[17] Soil is the basis for ecosystem productivity and for agricultural productive capacity.

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[11] "For the past 160,000 years, as tests of air bubbles in fossil ice show, the concentration of atmospheric carbon dioxide has been tightly correlated with the global average temperature. Now, boosted by combustion of fossil fuels and the destruction of tropical forests, the carbon dioxide concentration stands at 360 parts per million, the highest measure in the 160,000-year period." [Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf, page 285].

[12] "If humans utilized as food all the energy captured by plant photosynthesis, some 40 trillion watts, Earth could support 16 billion people. From such a fragile world, almost all other life forms would have to be excluded." [Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf, pages 281 to 282].

[13] "In the United Stated about one quarter of all prescriptions dispensed by pharmacies are substances extracted from plants. Another 13 percent originate from micro organisms and 3 percent from animals." [Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, pages 118 to 119].

[14] "The aquifers of the world, on which so much agriculture in the drier regions of the world depends, are being drained of their groundwater faster than the reserves can be replaced by natural percolation of rainfall and runoff." [Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf, page 284].

[15] Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, page 107.

[16] "In recent years, the soil erosion exceeded soil formation on about one-third of U.S. cropland, well over 60 million hectares ... (over one billion tonnes a year net of natural replacement)." [Myers, Norman, Editor. 1993. *Gaia: An Atlas of Planet Management*. New York: Doubleday, page 36].

The chief concerns related to forest and range practices are that soil is not degraded or eroded.

Forest Practices

The main forest practices are:

- Road and bridge building,
- Logging,
- Silviculture (planting, brushing, vegetation control including pesticide application, thinning, pruning, and fertilizer application),
- Watershed restoration,
- Fire fighting,
- Seed production (genetic diversity),
- Seedling production, and,
- Disease and pest control.

Purpose

The purpose of forest and range practices legislation is to ensure that, through the monitoring of key indicators, damage to the resources of biodiversity, water and soil is kept within acceptable levels of risk and that the practices are performed to science-based technical standards designed to meet planned outcomes at different spatial scales over various temporal scales – all within a larger legal regime and a land-use planning regime that ensure sustainability.

WLAP is responsible for the protection of biodiversity, water, and soil.

MSRM is responsible for sustainable economic development of all three resources and for the planning context within which development is to take place.

And MOF is responsible for protecting and managing the public forests and grasslands while sustaining them and the production of timber and fodder derived from them.

Values

With respect to the three resources -- biodiversity, water and soil -- British Columbians hold strong economic, environmental, and ethical values.

Economic Values. The production of timber and fodder is the primary economic value that citizens place on forests and grasslands. British Columbians also recognise that:

- The forests and grasslands provide other economic and cultural opportunities such as hunting, fishing, recreation, and tourism; and,

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[17] "The three domains of life are: bacteria; archaea; and eukarya, which include fungi, protozoans, animals, and plants." [Wilson, Edward O. 2002. *The Future of Life.* New York: Alfred A. Knopf, page 131].

- Revenues from forest and range lands contribute to the well being of all citizens.

Secondary economic values include botanical forest products, carbon sinks, and genetic material.

Environmental Values. Most citizens also place environmental values on the forests and grasslands. In particular, British Columbians recognise that:

- Their forests and grasslands sustain a rich diversity of microbes, plants, and animals.
- Their diverse ecosystems contribute to the health of all life. In particular, ecosystems regulate the atmosphere and climate[18]; purify and retain freshwater; form and enrich the soil; cycle nutrients; detoxify and recirculate wastes; pollinate crops; and produce timber, fodder, and biomass fuel.[19]
- Their forests and landscapes are essential to their sense of natural beauty and to their physical, spiritual and mental well being.

Ethical Values. Any code arises on a foundation of ethics. The reader of the discussion paper looks in vain for acknowledgement of the ethical values that underpin "the strong environmental concerns of British Columbians" to be respected.[20] We can expect many citizens to hold these ethical values:

- A conservation ethic " which aims to pass on to future generations the best part of the non-human world".[21] Not all citizens know or understand this world but most wish to take responsibility for it. Most citizens want to benefit economically from their forests but also sustain them for future British Columbians with all options intact.
- A respect ethic, which recognises that "... the life forms around us are too old, too complex, and potentially too useful to be carelessly discarded".[22]
- A heritage ethic comprising "a sense of genetic unity, kinship, and deep history ... [that] bond us to the living environment".[23] The forest and wilderness heritage is part of our past, our present, and our future identity as British Columbians (e.g., cultural heritage resources).

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[18] The scientists on the Intergovernmental Panel on Climate Change have made this assessment. "There will be an additional rise in the global average temperature of 1.0 to 3.5 degrees Celsius by the year 2100. Multiple consequences are likely, with few if any likely to be pleasant. Thermal expansion of marine waters and the partial break-up of the Antarctic and Greenland ice shelves will raise the sea level by as much as 30 centimetres causing problems for coastal nations. ... Precipitation patterns will change. ... Local climates will turn more variable, as heat waves increase in frequency. Even a small rise in average temperature results in many more instances of extremely high temperatures." [Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf, pages 285 to 286].

[19] Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, page 106.

[20] Premier of British Columbia. Letters to the Honourable Michael de Jong and to the Honourable Stan Hagan both dated June 25th, 2001.

[21] Wilson, Edward O. 2002. *The Future of Life*. New York: Alfred A. Knopf, page 131.

[22] *Ibid*., page 131.

[23] *Ibid*., page 133.

Principles

The economic, environmental and ethical values held by citizens converge towards three chief principles by which one might expect they would choose to have their forest and range lands managed:

1. Protection and conservation of biodiversity, water, and soil.
2. Sustainable and integrated resource use, and,
3. Science-based decision-making.

The three preceding principles apply equally to the three ministries: WLAP, MSRM, and MOF.

Protection and Conservation. British Columbia has implemented a successful protected areas strategy that has resulted in over 12 percent of the land base being set aside for non-human use. But protected areas alone are not sufficient protection for biodiversity.

One of the main concerns that conservation biologists have about protected areas is that they are islands. As islands they may "cease to be part of a continuous ecosystem that is larger and richer than each of them [and as a result they will] … no longer be samples but isolates for many flora and fauna."[24]

This concern is supported by the science of island biogeography, which tells us that:

- Limited habitat area correlates with limited species diversity;
- The species-area relationship is empirical – small islands harbour fewer species than large islands[25];
- Species vary greatly in their resistance to extinction;
- Islands tend to attain equilibrium of species achieved through extinction, extirpation, and emigration being balanced by speciation and immigration.
- Small islands receive fewer immigrants and suffer more extinctions and extirpations than do large islands (area effect)[26]; and,
- Remote islands receive fewer immigrants and suffer just as much extinction and extirpation as do near islands (distance effect).[27]

Therefore, conservation and protection of biodiversity on lands surrounding protected areas, connectivity among these areas, and limits to fragmentation of the landscape surrounding them are important. Hence, one reason among others for a principle of protection and conservation in forest and range practices.

Sustainability. The concept of sustainability describes a tension between two sides of the same coin:

- Utilitarianism and biocentrism,
- Sustaining the resource and sustaining the benefits derived from it, and,

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[24] Quammen, David. 1996. *The Song of the Dodo*. New York: Scribner, page 405
[25] *Ibid.*, page 423.
[26] *Ibid.*, page 423.
[27] *Ibid.*, page 423.

- Conservation and development.

Sustainability is a dimensional concept. Its dimensions are threefold: spatial, temporal, and value-based. Therefore, sustainable management has to occur within a planning context that considers time (short, mid and long term) and space (ecoregion, landscape, and watershed), and clearly lays out the expectations and acceptable risks of sustainable use of biodiversity, soil and water.

Without the land-use planning context, sustainable resource use and good forest practices become exercises in folklore. Moreover, accountability for poor land management becomes difficult, and compliance with the law becomes potentially unenforceable.

Science-based Decision-making. The phrase, "science-based decision-making" sounds impressive. But it is deceptive if used as empty rhetoric.

Our scientific knowledge about biodiversity, water, and soil is extremely limited. Edward O. Wilson writes: "[We] know very little about the real biological and physical forces that create air, water, and soil. Even the most able naturalist can trace no more than a faint outline of an ecosystem to which he has devoted a life time of study."[28]

Some may argue it is presumptuous to prescribe "results" for licensees when we know so little about what is at risk from forest practices conducted on an industrial scale of forestry for over a century in British Columbia.

So, to assert that decision-making will be science-based is noble in intent. However, the application of such a principle is limited by a paucity of scientific knowledge about how forest and range practices affect:

- The resources of biodiversity, water, and soil, and,
- The ecosystem services on which all life depends.

The principle of environmental management based on science-based decision-making is unassailable. We just need more science.

New Era Commitments

The challenge facing the three ministries – WLAP, MSRM, and MOF -- is to make compatible the preceding three principles with the "new era" commitments of the government, namely:

- To streamline the forest practices code to establish a workable, results-based code, with tough penalties for non-compliance.
- To cut the forestry regulatory burden by one-third within three years, without compromising environmental standards.

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[28] Wilson, Edward O. 1998. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf, page 236.

- To increase the Allowable Annual Cut over time through scientific forest management, proper planning, and incentives to promote enhanced silviculture.
- To provide greater access to Crown land resources to protect and create jobs in tourism, mining, forestry, farming, ranching, and oil and gas production.[29]

In both letters to the minister of forests and to the minister of sustainable resource management, the premier recognises the strong environmental concerns of citizens by writing:

> "*We will not, however, achieve economic development at the expense of a sustainable environment. Our program will ensure that economic development maintains the highest environmental standards and respects the strong environmental concerns of British Columbians. I expect you to be vigilant within your ministry to assure our environmental stewardship is exemplary.*"[30]

In his letter to the minister of sustainable resource management, the premier outlines in the agenda for that ministry the adoption of "*a scientifically based, principled approach to environmental management that ensures sustainability, accountability and responsibility*".

The new era commitments appear not to be wholly consistent with the premier's exhortation to the two ministers and with the three principles of forest and range management – protection and conservation, sustainability, and science-based decision-making.

The contradictions are not wrong. They create the tension and dualism that we spoke of under "sustainability" – between utilitarianism and biocentrism; between sustaining the resource and sustaining the benefits derived from it; and, between conservation and development.

The question is: How do we achieve the balance between opposing forces?" Ostensibly, the new results-based code will contain some of the laws and regulations by which we attain that balance.

As the premier acknowledges, British Columbians have strong environmental concerns to be respected. However, the discussion paper raises some simple questions about those concerns that citizens might reasonably ask.

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[29] Gordon Campbell and the BC Liberals. 2001. *A New Era for British Columbia: A Vision for Hope & Prosperity for the Next Decade and Beyond.* www.bcliberals.com

[30] Premier of British Columbia. Letters to the Honourable Michael de Jong and to the Honourable Stan Hagan both dated June 25th, 2001.

QUESTIONS

So, having read the discussion paper on the draft results-based code for forest and range practices, the concerned citizen might reasonably ask these questions:

1. Will the results-based code:
   - Articulate accurately the economic, environmental and ethical values held by British Columbians and differentiate clearly between them?
   - Set out the principles by which forests and grasslands are to be managed? Will it explain what sustainability and sustainable use mean?
   - Specify clearly that biodiversity, water and soil are the chief resources we need to protect, conserve, and sustainably develop? Will the timber resource be accurately represented as a part of a larger biodiversity resource?
   - List and explain the main forest and range practices?
   - Explain what biodiversity, water, and soil mean and why it is important to strike a balance between their conservation and development? Will it help to indicate what that balance might be and to define it?
   - Clearly spell out the relationship between each forest and range practice and its corresponding potential negative impact on biodiversity, water, and soil? Will it stipulate an acceptable level of risk of damage to biodiversity, water, and soil for each forest and range practice?
2. Will the results-based code explain that we cannot use the resources of biodiversity, water and soil without some risk to their integrity and conservation? Will it explain how a results-based code will limit our risks and to what levels? Indeed, what are acceptable and prudent levels of risk?
3. Will forest and range practices on public lands in British Columbia result in:
   - Damage to, and fragmentation of, habitat being limited within acceptable levels of risk to biodiversity;
   - Control of invasive plants within acceptable limits;
   - Minimised damage to riparian systems and maintenance of the quantity and quality of fresh water to acceptable standards;
   - Minimised degradation and erosion of the soil within acceptable standards; and,
   - Sustainable economic development of the timber and fodder resources while maintaining high environmental standards?
4. Given the new era commitments, is it possible to strike the right balance between development and conservation, between what is destroyed and what is preserved, and between what is developed for humankind and what is left for non-human life? Is the code an effective legal instrument to help ensure balance is achieved? And how will a results-based code premised on the principles of protection and conservation, sustainability and science-based decision-making conflict with some of those commitments?
5. Will the proposed results-based code be enforceable? What legal advice does government have that indicates the code will be enforceable?

CONCLUSION

The concerned citizen should seek informed answers to the preceding questions in order to determine whether she has confidence in the results-based code providing:

- The law necessary to regulate forest and range practices so that biodiversity, water, and soil are protected and conserved;
- Prudent limits to risk of damage to biodiversity, soil, and water and defined acceptable levels of risk for each forest and range practice;
- Science-based standards for forest and range practices; and,
- A supportive role in striking the right balance between conservation and economic development in order to comply with the premier's exhortation to his ministers and to fulfil new era commitments.

This writer would like to see a code that can be readily described as a matrix showing real forest and range practices on the y-axis plotted against the resources of biodiversity, water, and soil on the x-axis. For each practice, the matrix would precisely articulate what resources (biodiversity, water, and soil) are at risk of damage and the type of damage to be expected. Damage is further classified at different scales of resolution (ecoregion, landscape, and watershed) over different scales of time (short, mid, and long term). For each type of damage so classified, the code would ascribe to each contributory practice an acceptable level of risk, science-based standards, and a key indicator. For each forest and range practice, best management practices would be available to attain the standards within the prescribed levels of risk of damage to biodiversity, water, and soil. The purpose of the key indicator is to allow monitoring and evaluation of forest and range practices in order to be able to assess how well they support ecological sustainability, both in space and over time. Such a code would be able to support the attainment of land-use objectives determined within an overarching construct of ecological, economic and social sustainability – the real results on which one might reasonably expect the code to be based.

This writer cautions that some key elements of an enforceable results-based code appear not to be in place – particularly a balanced conceptual framework, key indicators, and clear land-use objectives based on the principle of sustainability. Their omission would make it difficult to hold licensees accountable or to apply the promised tough penalties for non-compliance with the code, which, in short, is the government's stated intent.

"In the end, our society will be defined not only by what we create, but by what we refuse to destroy."

John Sawhill